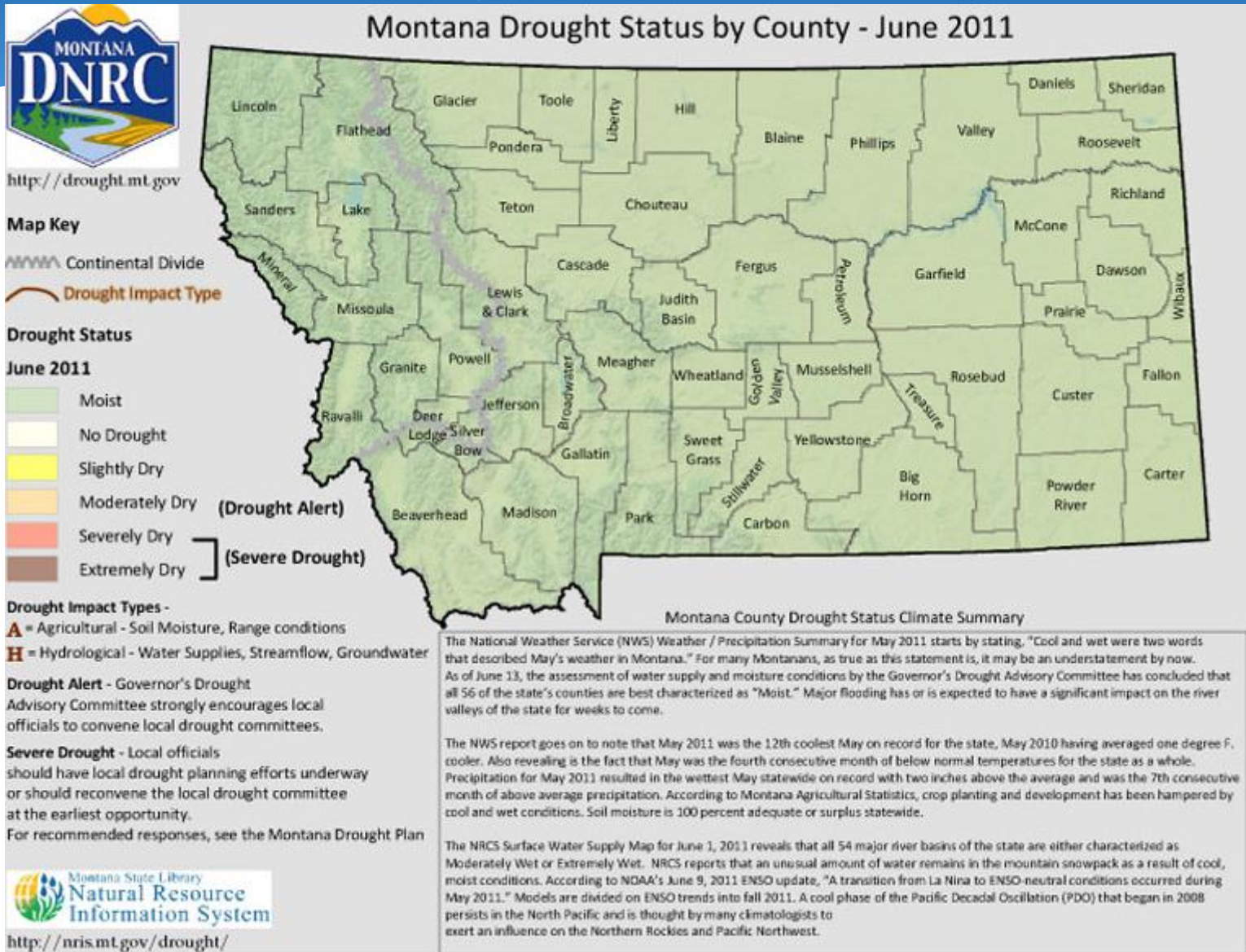
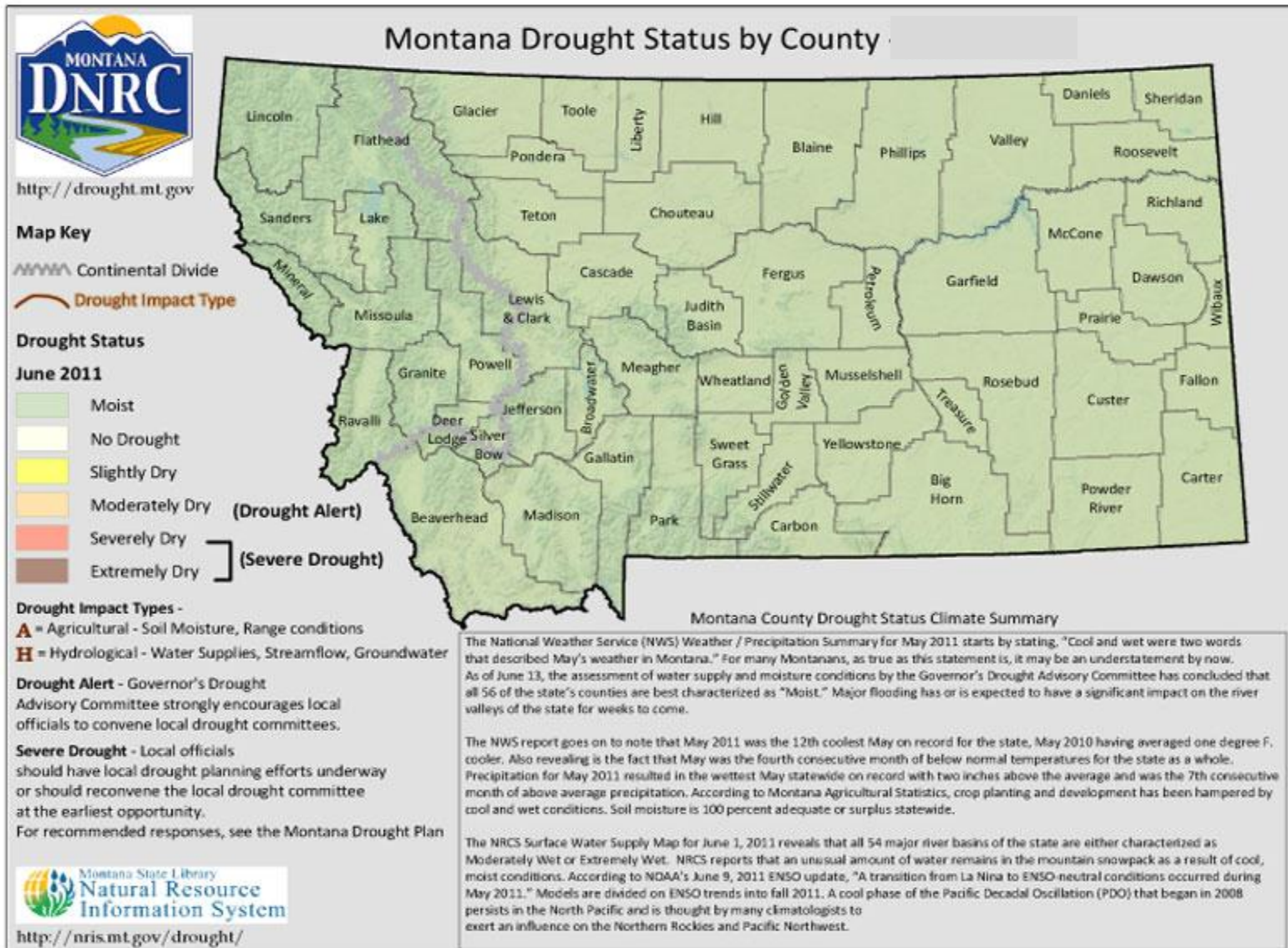


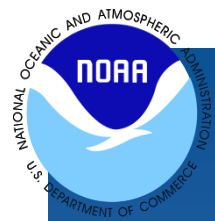
# Montana Drought Status June 2011



# Montana Drought Status

## July 2011





# Governor's Drought Advisory Committee

July 20, 2011

National Weather Service

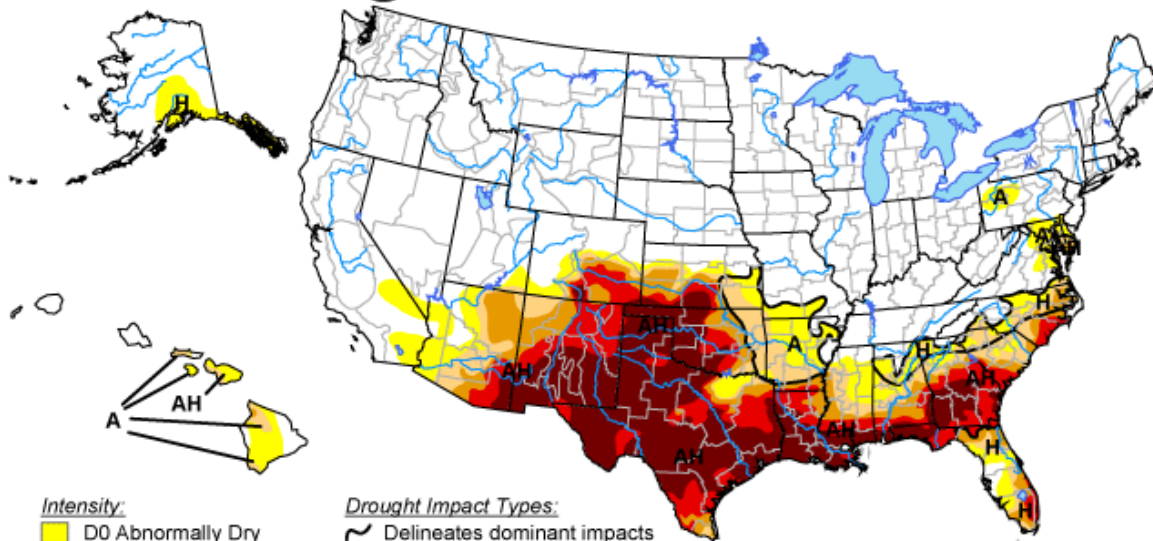
David Bernhardt

# National Drought Monitor

## Issued July 12, 2011

### U.S. Drought Monitor

July 12, 2011  
Valid 8 a.m. EDT



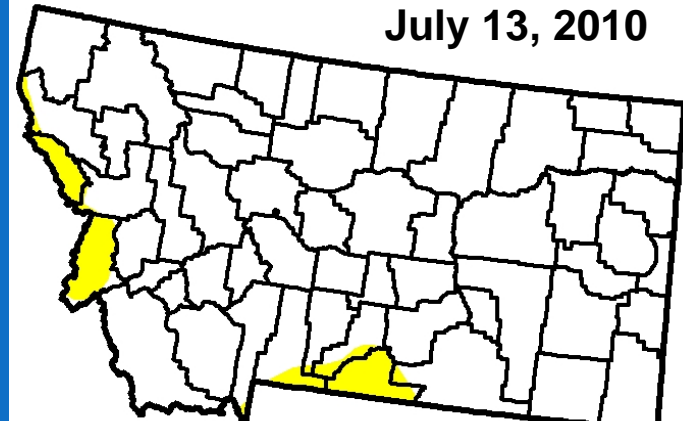
<http://drought.unl.edu/>

\* Montana void of any drought classifications

July 12, 2011

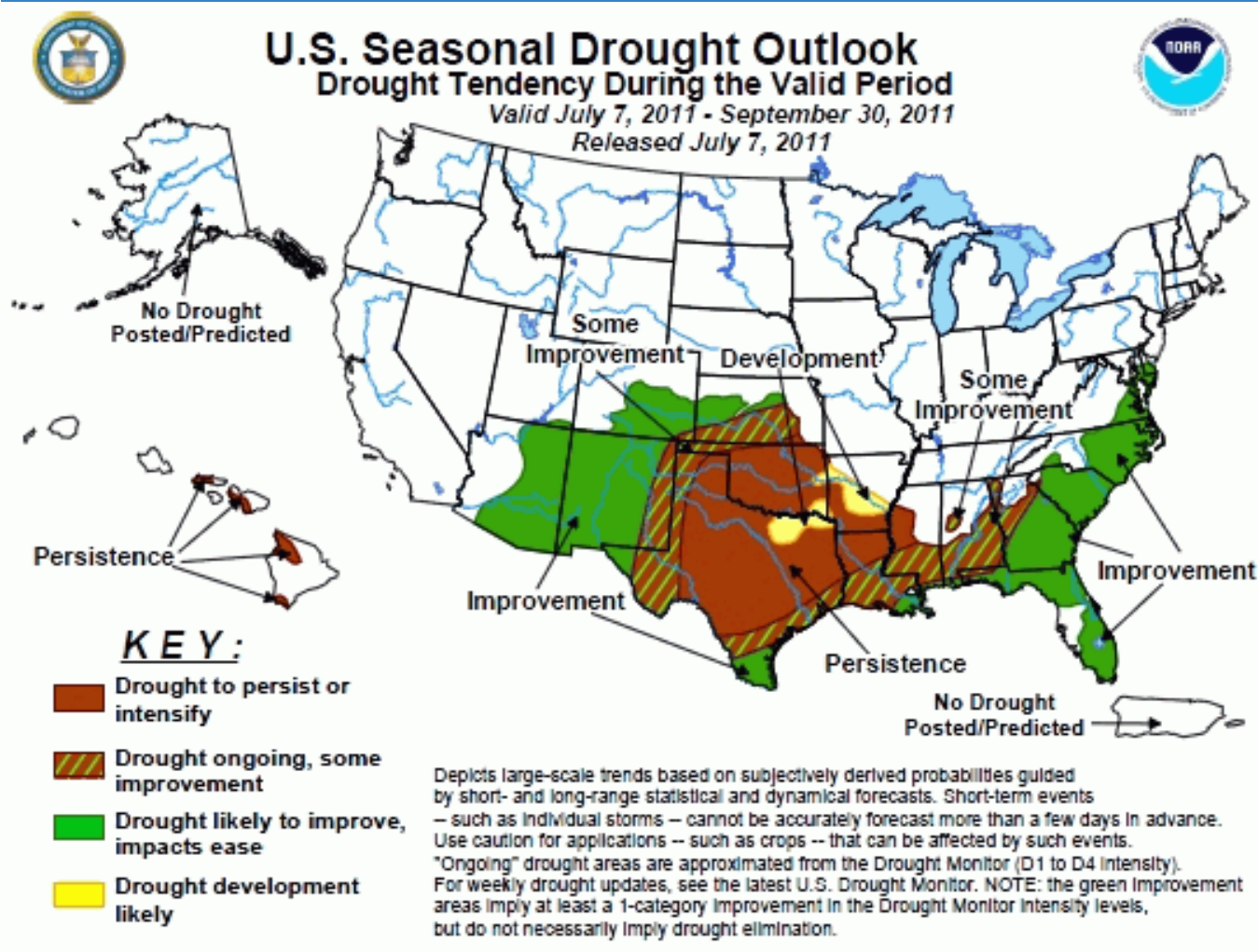


July 13, 2010



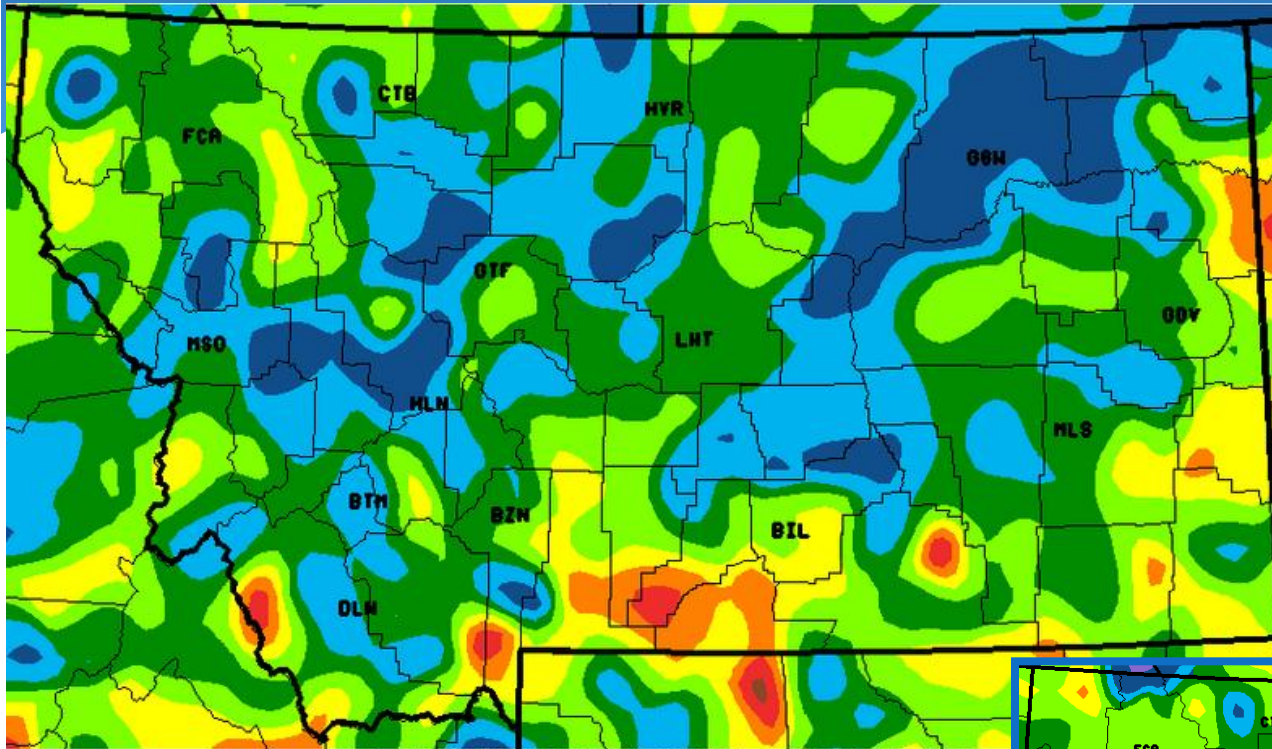
# Drought Outlook through August

## Issued July 7, 2011



\* No drought development forecast for Montana through September

# Percent of Normal Precipitation June 2011



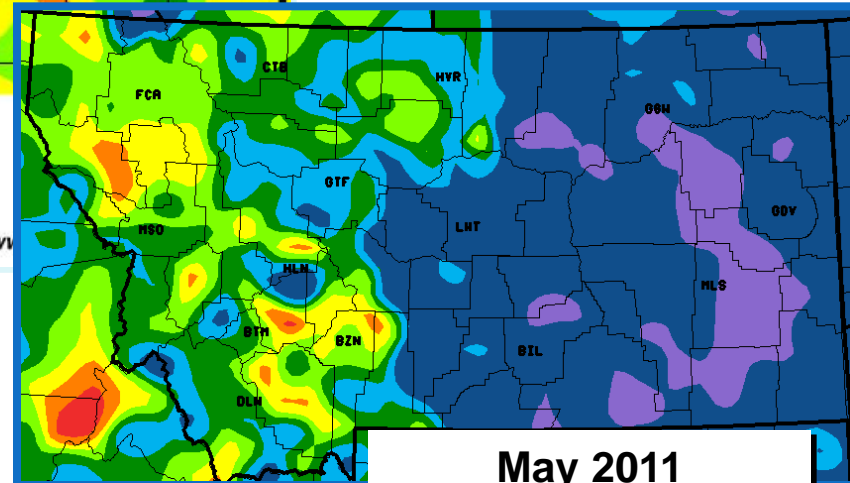
- \* Most of Montana near to above normal
- \* Isolated areas south and east below to well below normal

June 2011 Percent of Normal Precipitation  
Period of Normal: 1971-2000

20 40 60 85 115 150 200

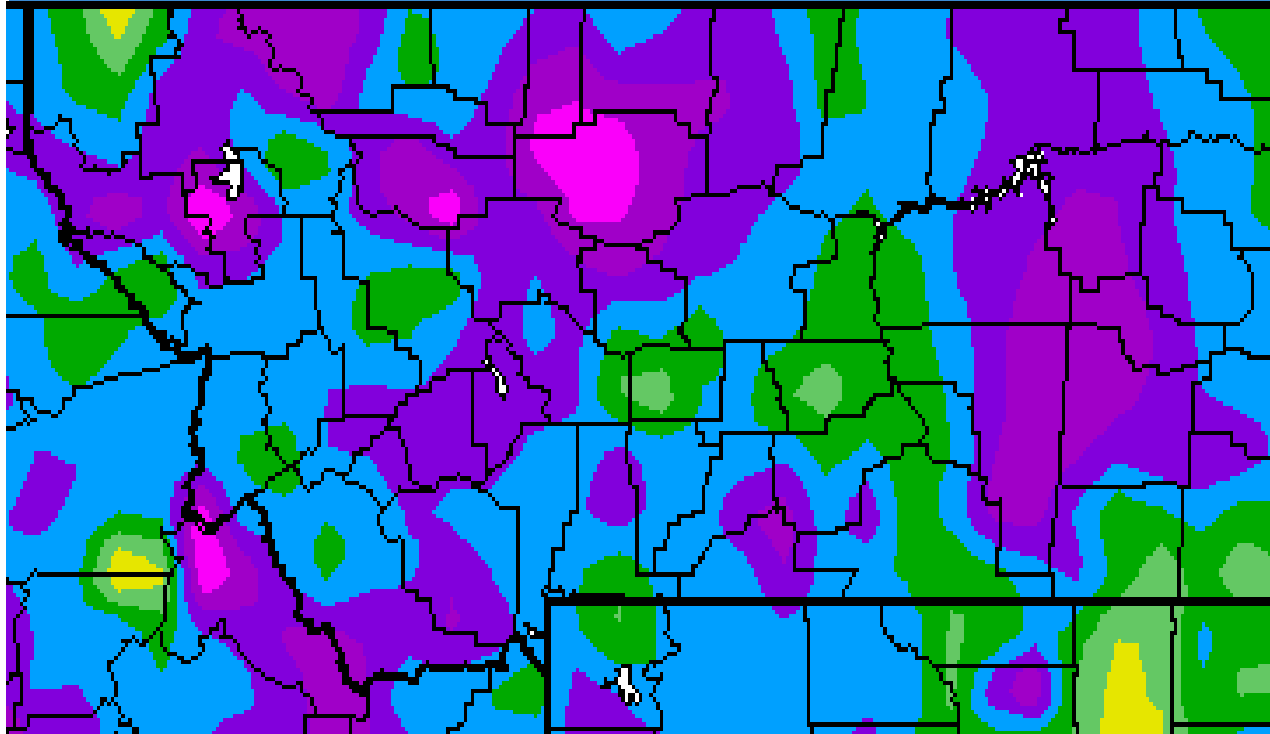
NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www>



May 2011

# Departure from Average Temperature June 2011



- \* All of Montana averaged below normal
- \* Generally 2 – 5 degrees below normal

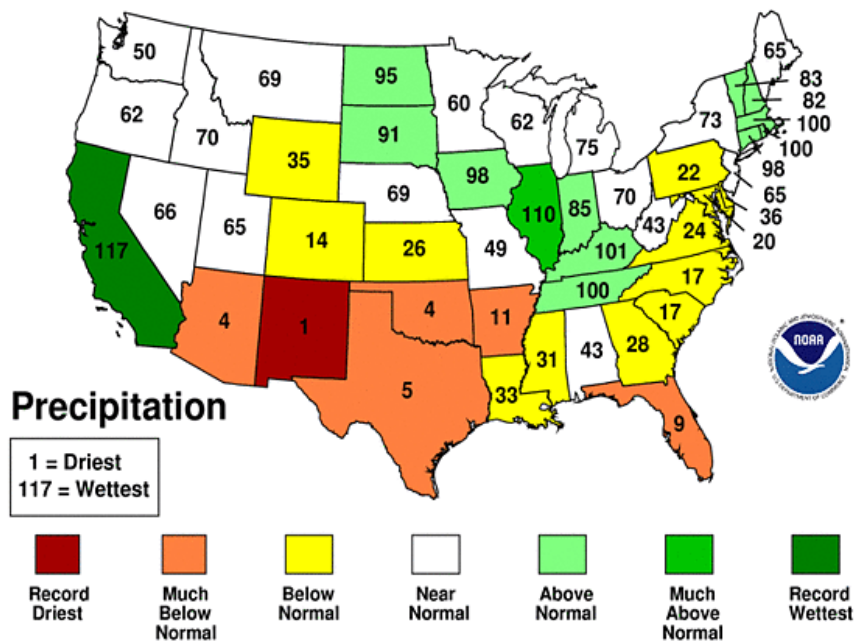


# Precipitation Rankings

## June 2011 and Last 12 Months

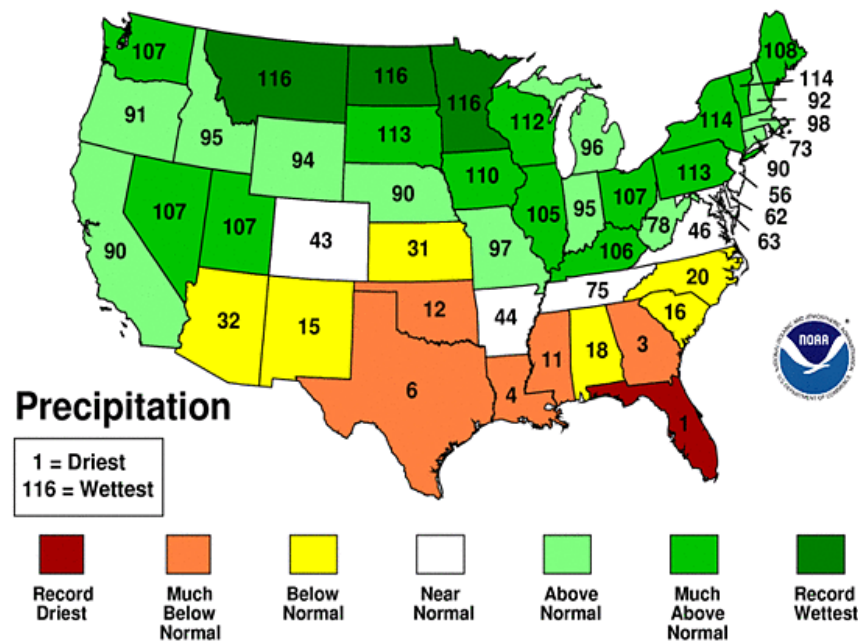
### June 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



### Jul 2010-Jun 2011 Statewide Ranks

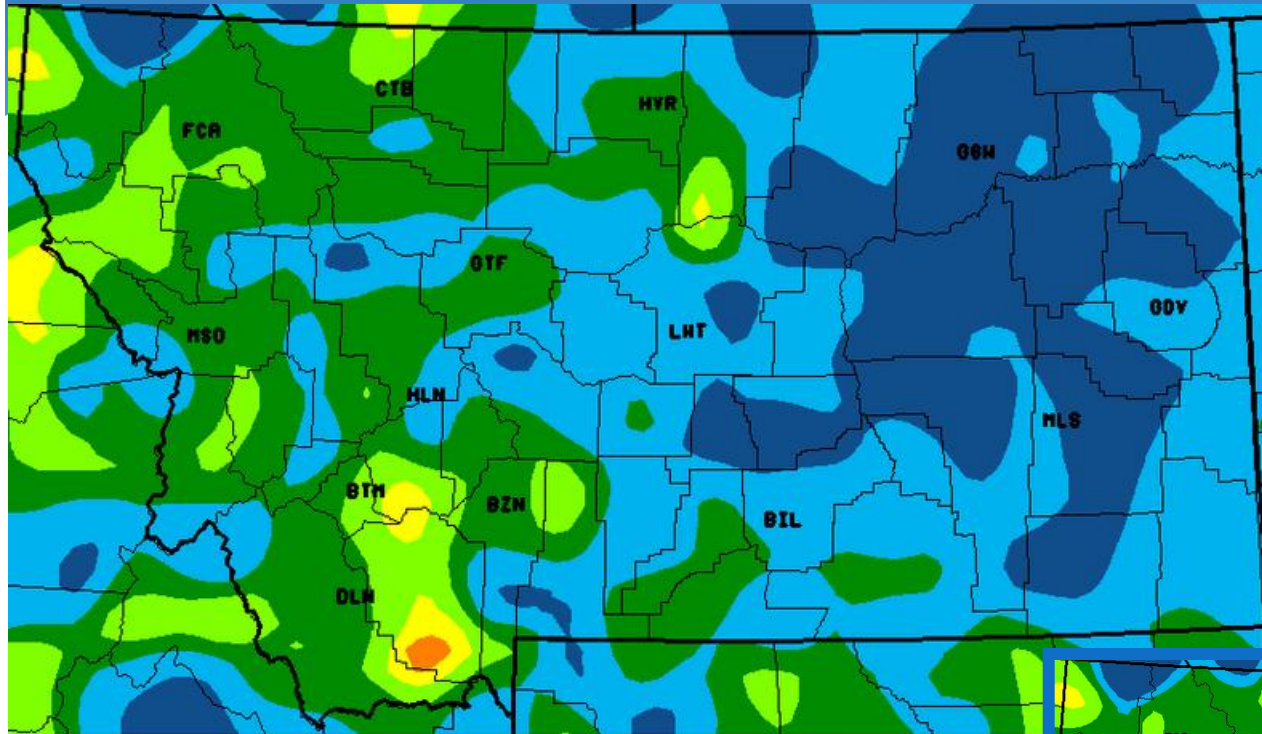
National Climatic Data Center/NESDIS/NOAA



- \* June near normal
- \* 69<sup>th</sup> driest
- \* 49<sup>th</sup> wettest

- \* Last 12 months (July 2010 through June 2011) wettest on record for that period

# Percent of Normal Precipitation Water Year 2011



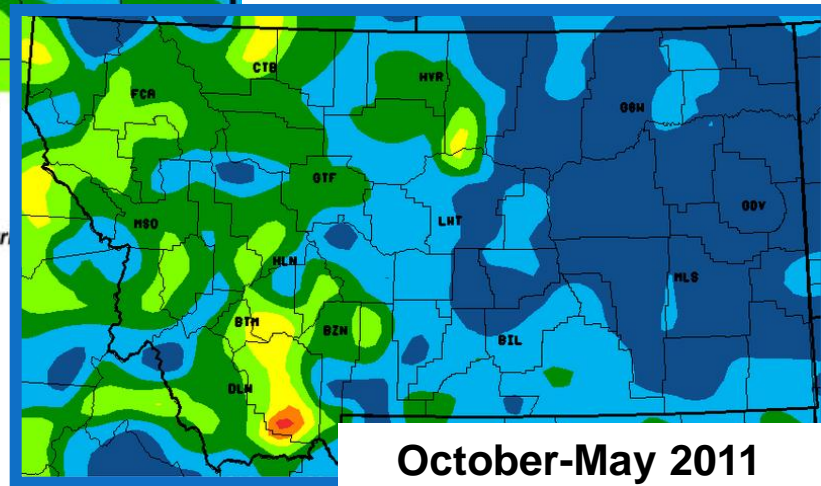
Oct 2010-Jun 2011 Percent of Normal Precipitation  
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

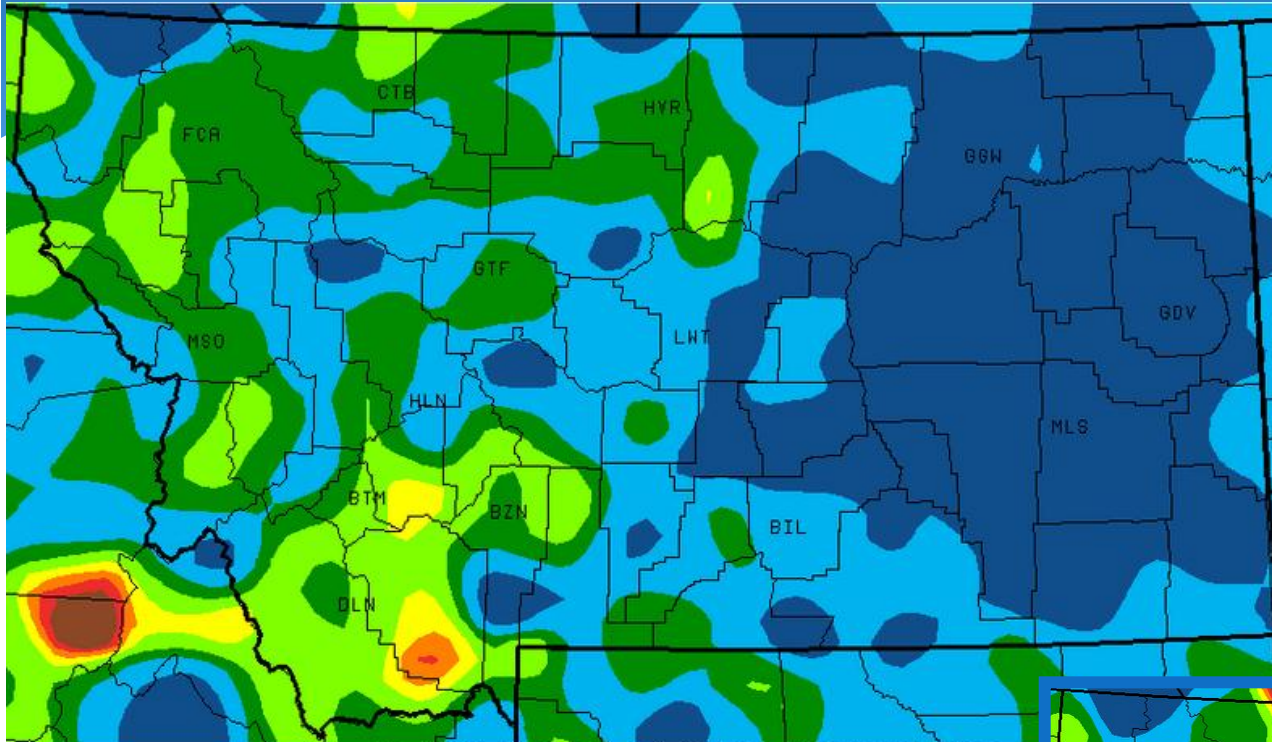
<http://www.wr>

- \* October – June
- \* Most of Montana remains above to well above normal



October-May 2011

# Percent of Normal Precipitation Calendar Year 2011



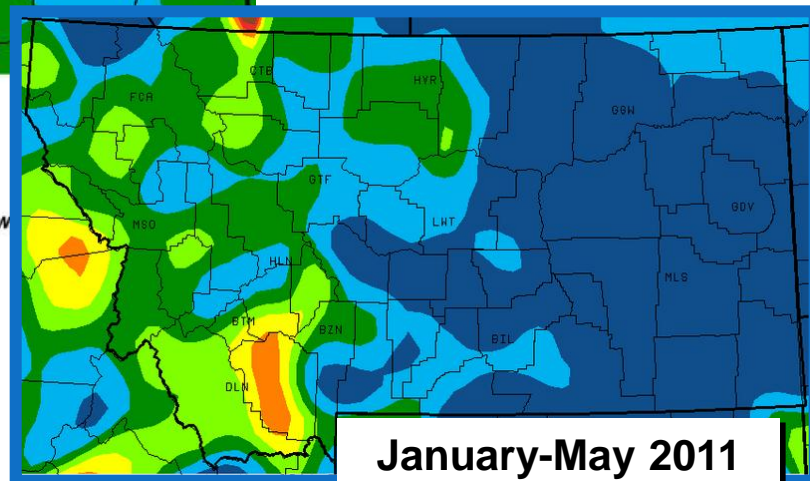
Jan-Jun 2011 Percent of Normal Precipitation  
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

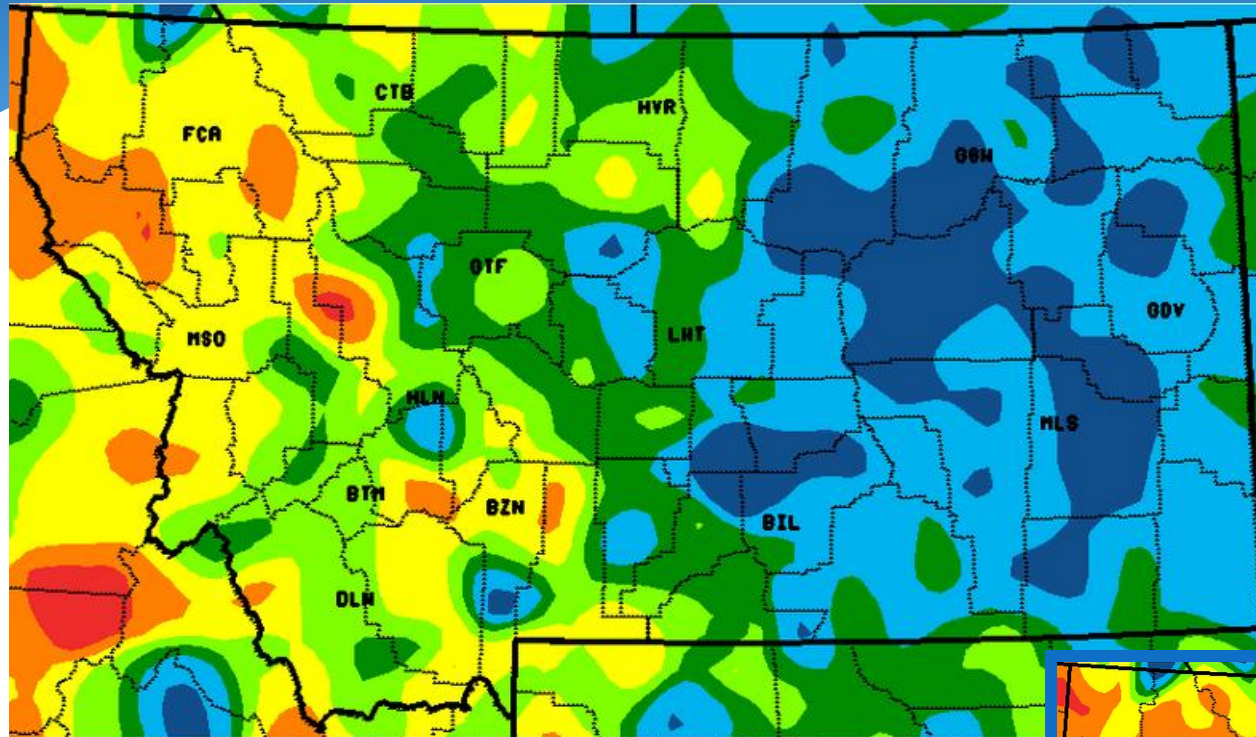
<http://www.w>

- \* January – June
- \* Most of Montana remains above to well above normal



January-May 2011

# Percent of Normal Precipitation Crop Year 2011



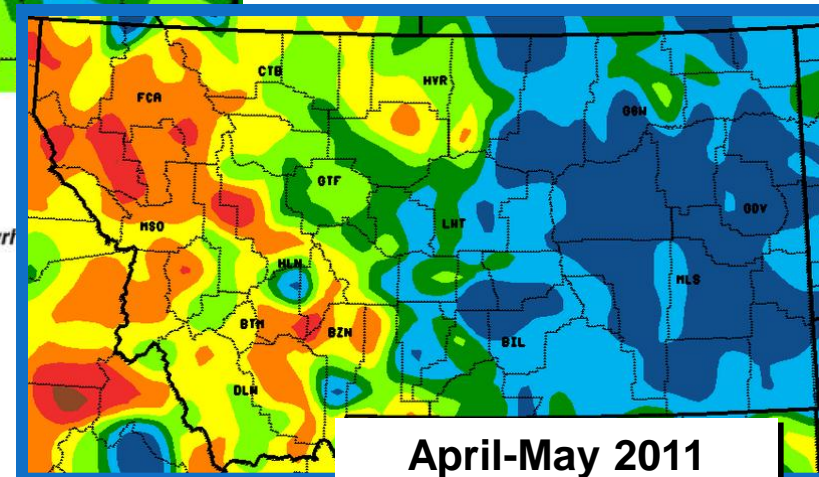
Apr-Jun 2011 Percent of Normal Precipitation  
Period of Normal: 1971-2000

20 40 60 85 115 150 200

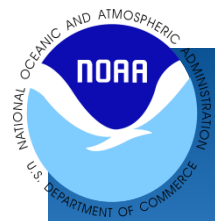
NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.wrf>

- \* April – June
- \* West of the divide – below to well below normal
- \* Central – near to above normal
- \* East – well above normal

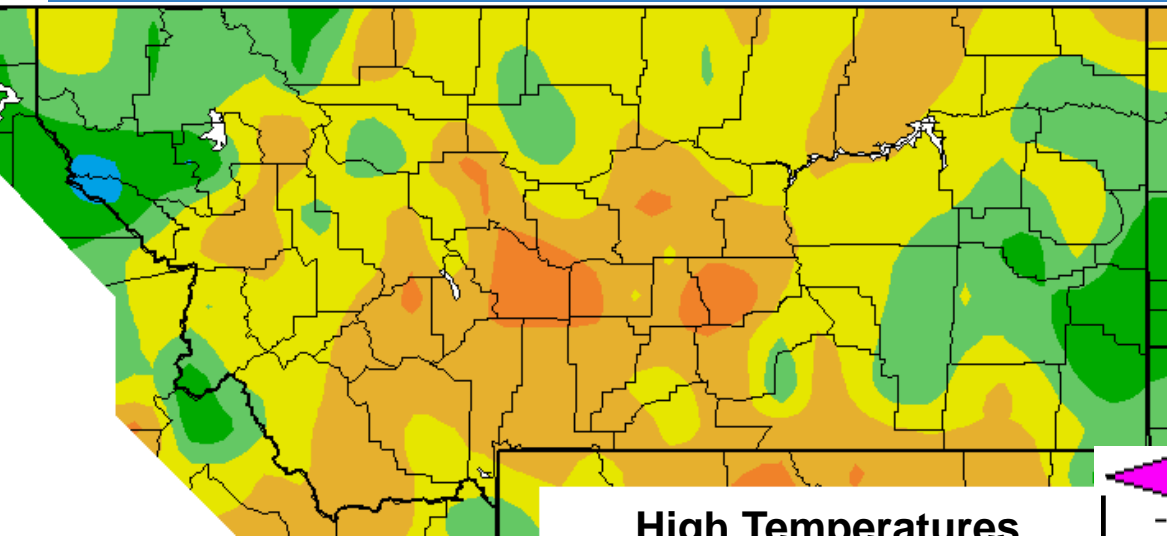


April-May 2011



# Temperature Anomalies

## July 1 – 18

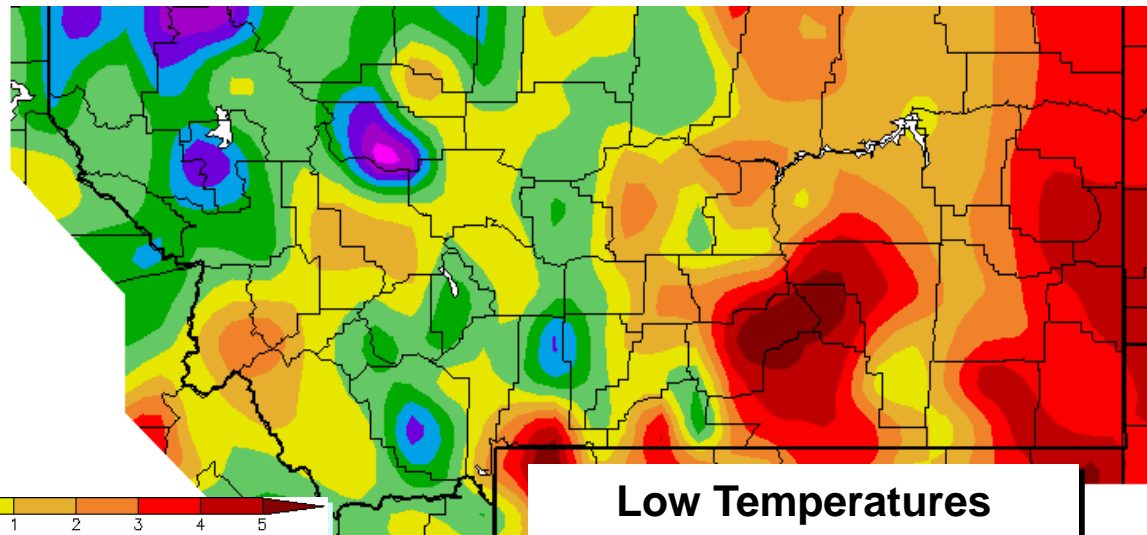


| Location    | Jul 1-18 | Dep from Norm |
|-------------|----------|---------------|
| Baker       | 72.3     | +1.7          |
| Billings    | 75.0     | +3.7          |
| Bozeman     | 68.0     | +2.6          |
| Butte       | 63.5     | +1.4          |
| Cut Bank    | 64.7     | +2.2          |
| Dillon      | 66.2     | +2.0          |
| Glasgow     | 72.9     | +3.6          |
| Great Falls | 68.6     | +3.1          |
| Havre       | 70.2     | +2.6          |
| Helena      | 70.1     | +3.1          |
| Jordan      | 72.7     | +1.8          |
| Kalispell   | 63.2     | +0.4          |
| Lewistown   | 67.8     | +4.1          |
| Livingston  | 67.9     | +1.3          |
| Miles City  | 75.2     | +1.8          |
| Missoula    | 67.2     | +0.9          |

**High Temperatures**

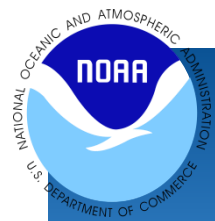


- \* Temperatures averaging near to above normal
- \* Highs – 4 below (green) to 5 degrees above normal (orange)
- \* Lows – 1-3 degrees below normal west to 3-5 degrees above normal east



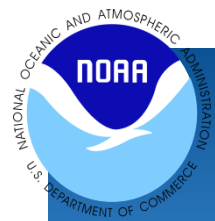
**Low Temperatures**





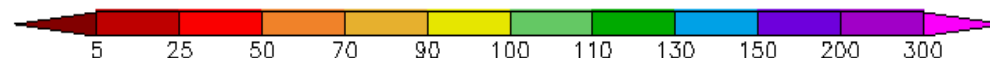
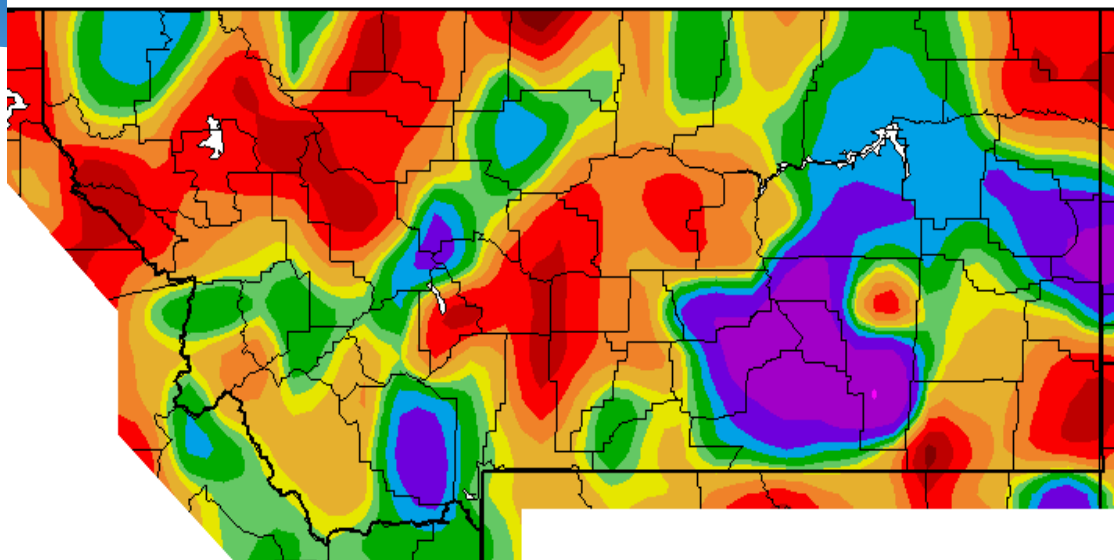
# Jul 17-20 2011 heat

- \* Highest temp – 106°F in northeast Fergus County
  - \* 103°F at Fort Benton and Hardin
- \* Lows in the lower 70s east
- \* Very humid east - dew point temperature of 77°F at Sidney
  - \* Possibly the highest known dew point in Montana
  - \* Highest dew points since June 2005.
- \* Followed by cold front and gusty winds - over 50 mph gusts along Rocky Mountain Front.



# Percent of Average Precipitation July 1 – 18

| Location    | Jul 1-18 | % of Norm |
|-------------|----------|-----------|
| Baker       | 0.12     | 17%       |
| Billings    | 0.90     | 105%      |
| Bozeman     | 0.74     | 89%       |
| Butte       | 0.69     | 70%       |
| Cut Bank    | 0.06     | 8%        |
| Dillon      | 0.47     | 60%       |
| Glasgow     | 1.50     | 117%      |
| Great Falls | 0.85     | 90%       |
| Havre       | 1.01     | 103%      |
| Helena      | 1.19     | 142%      |
| Jordan      | 2.02     | 176%      |
| Kalispell   | 0.29     | 31%       |
| Lewistown   | 0.73     | 53%       |
| Livingston  | 0.28     | 27%       |
| Miles City  | 1.01     | 93%       |
| Missoula    | 0.51     | 71%       |
| Mullan Pass | 0.45     | 52%       |
| Wolf Point  | 1.81     | 141%      |
| Glendive    | 1.80     | 150%      |
| Sidney      | 1.30     | 89%       |
| BZN-MSU     | 0.80     | 83%       |

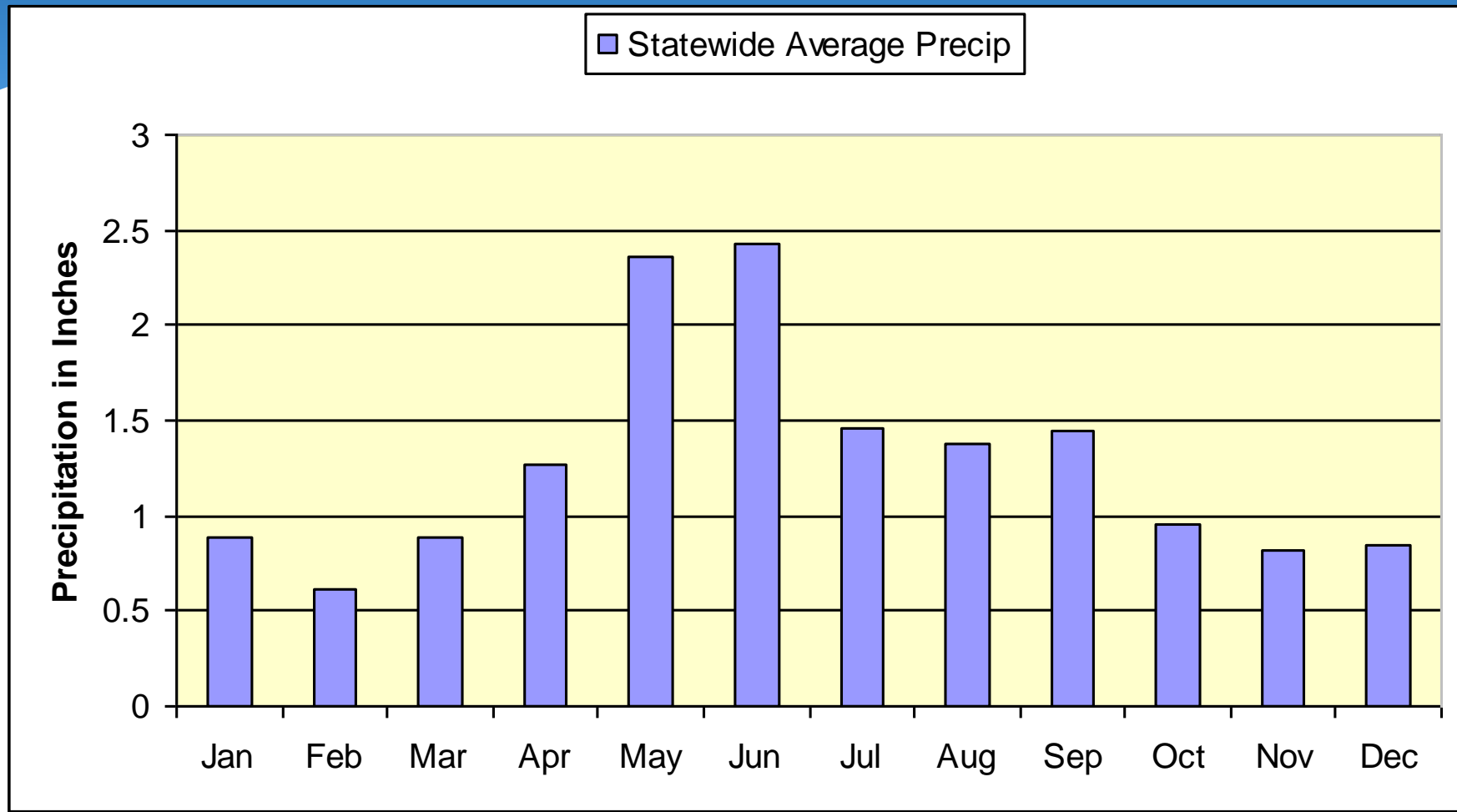


\* Well above normal portions of eastern, southwest and northwest Montana.

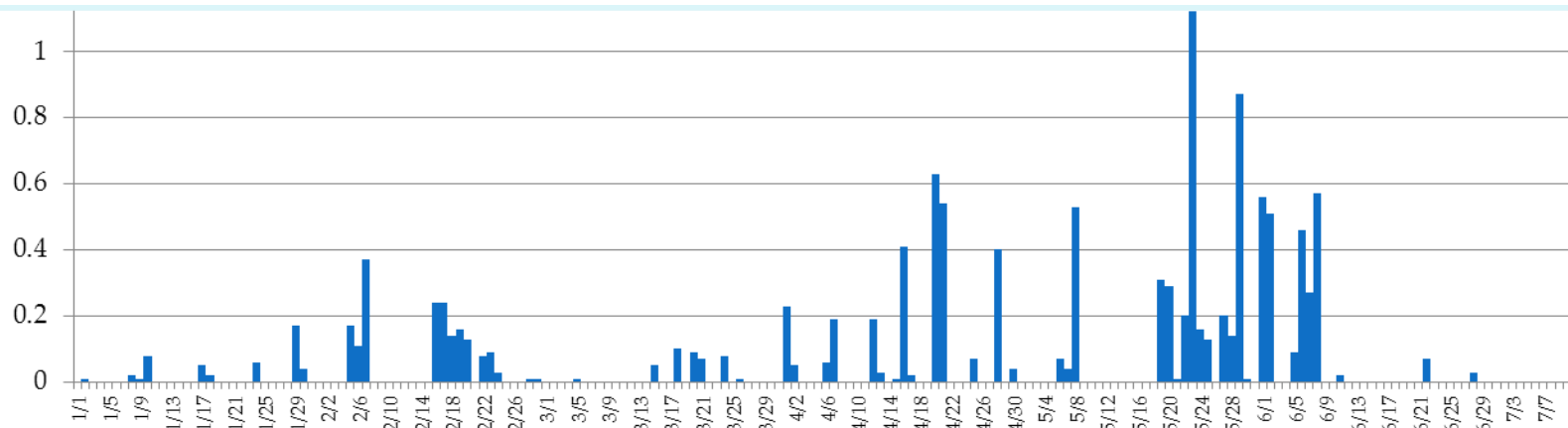
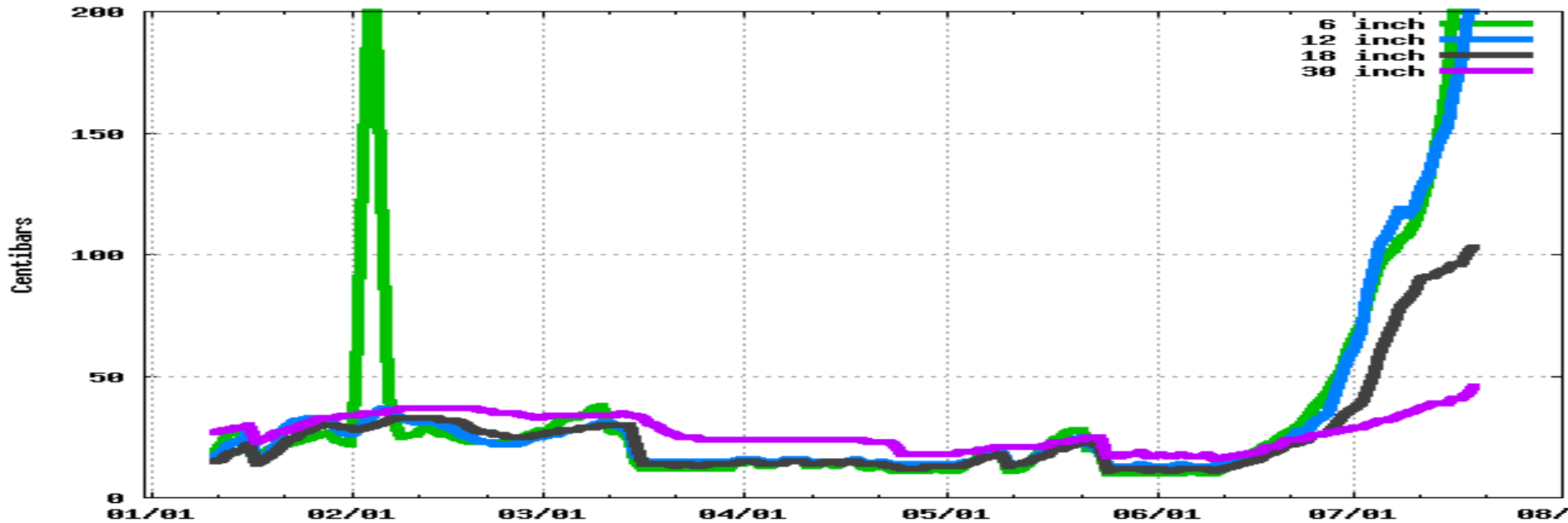
\* Large swaths of below normal from west-central through north central, northeast and central Montana

# Statewide Average Precipitation

July typically begins decrease in summer precipitation

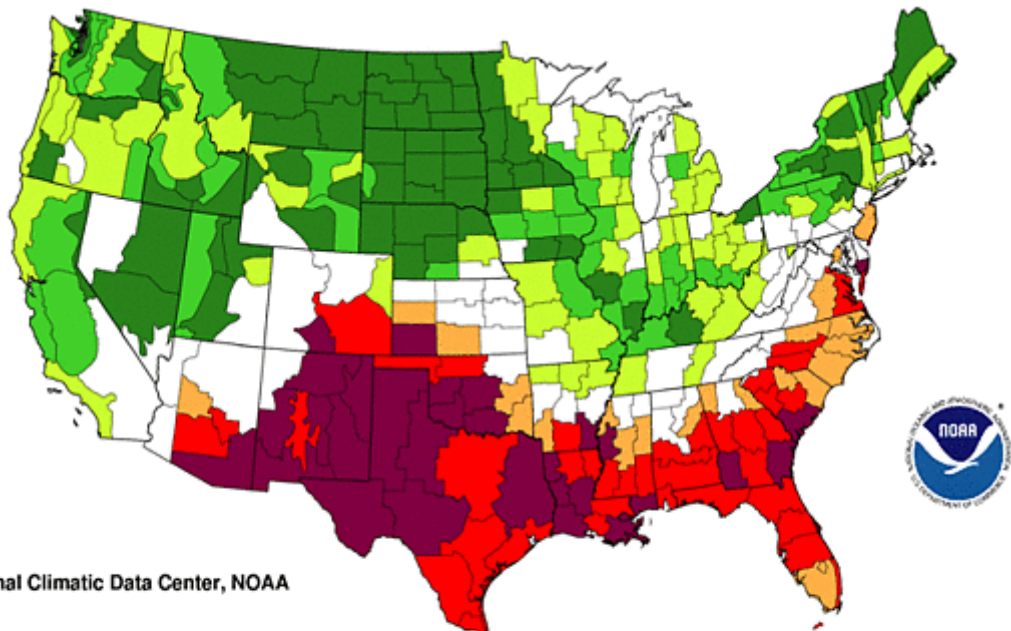


# Great Falls Soil Moisture



# Palmer Hydrological Drought Index

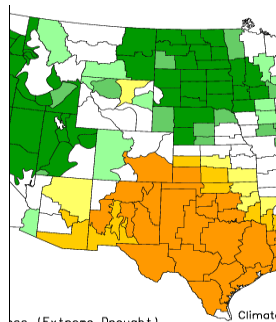
## June 2011



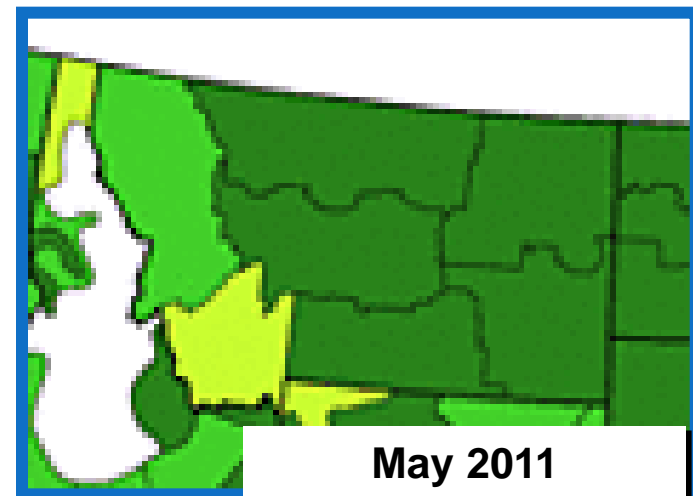
National Climatic Data Center, NOAA



Jul 16



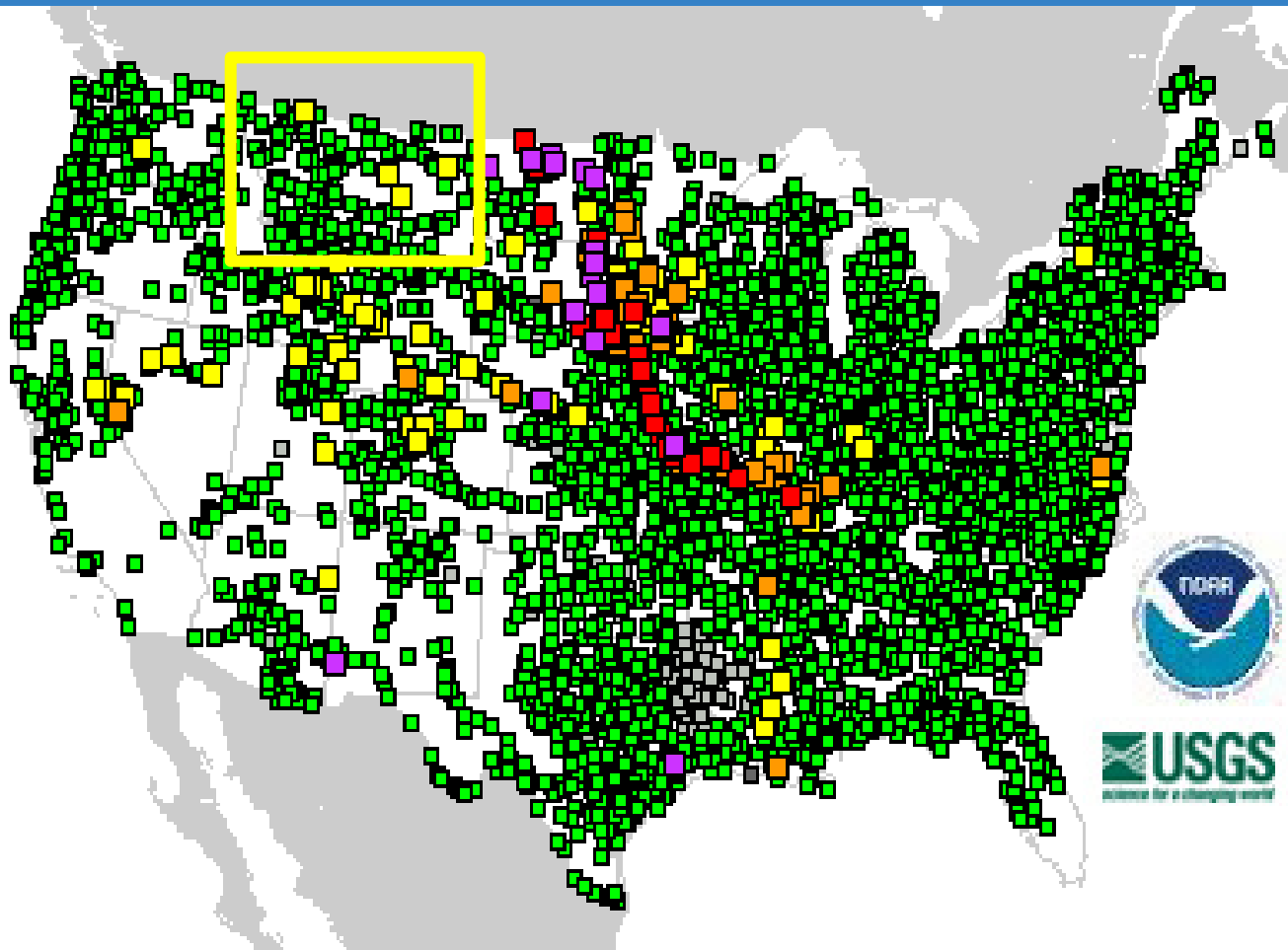
- \* 'Extremely Moist'
  - \* North central
  - \* Northeast
  - \* Central
  - \* South Central
  - \* Southeast
- \* 'Very Moist'
  - \* West
- \* 'Moderately Moist'
  - \* Southwest



May 2011

# Current Flooding

## No sites in Montana above Flood Stage



### Map Legend

Major Flooding

Moderate Flooding

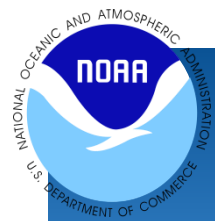
Minor Flooding

Near Flood Stage

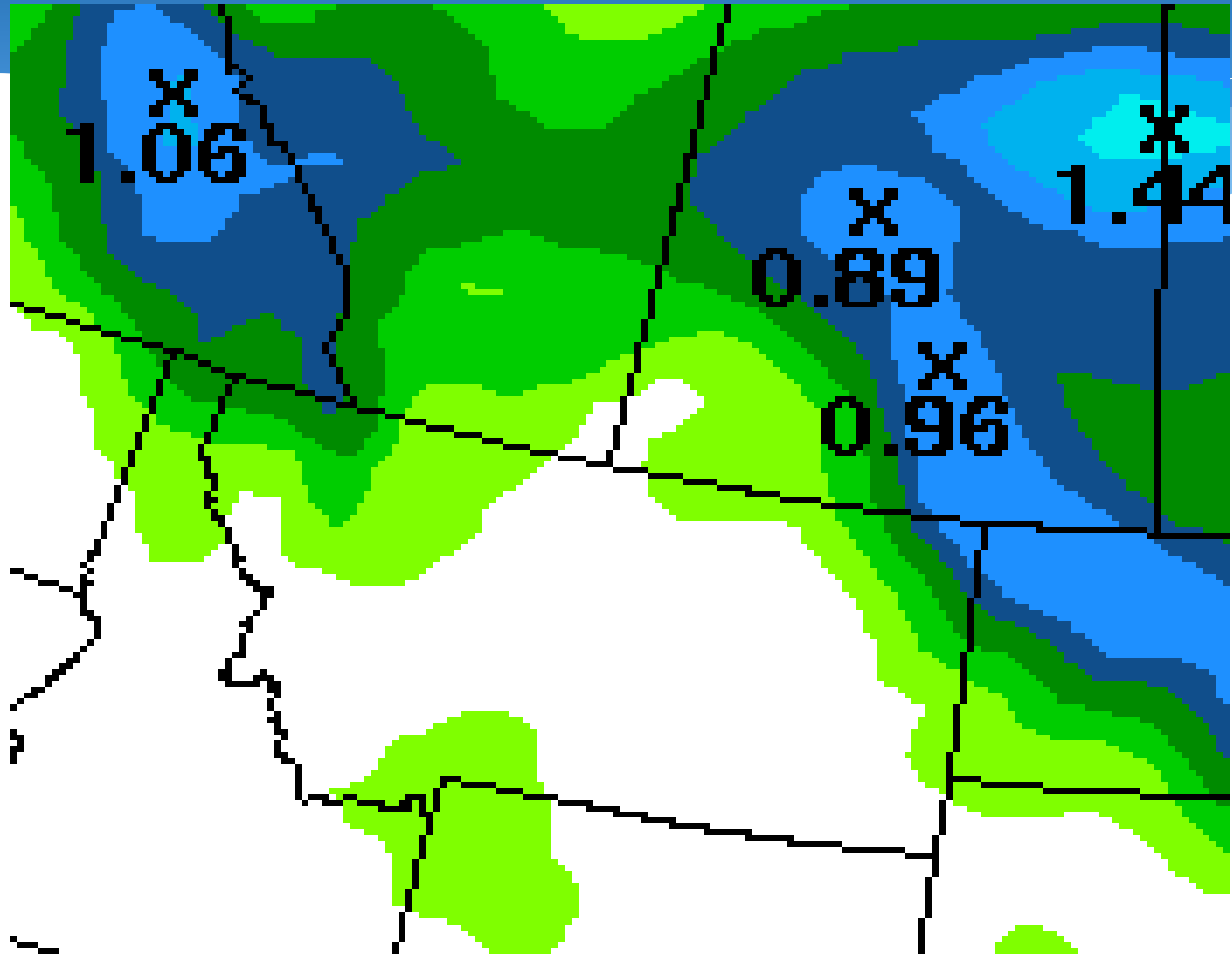
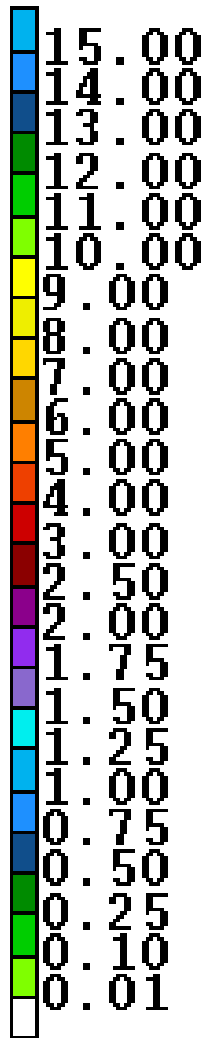
No Flooding

No Data

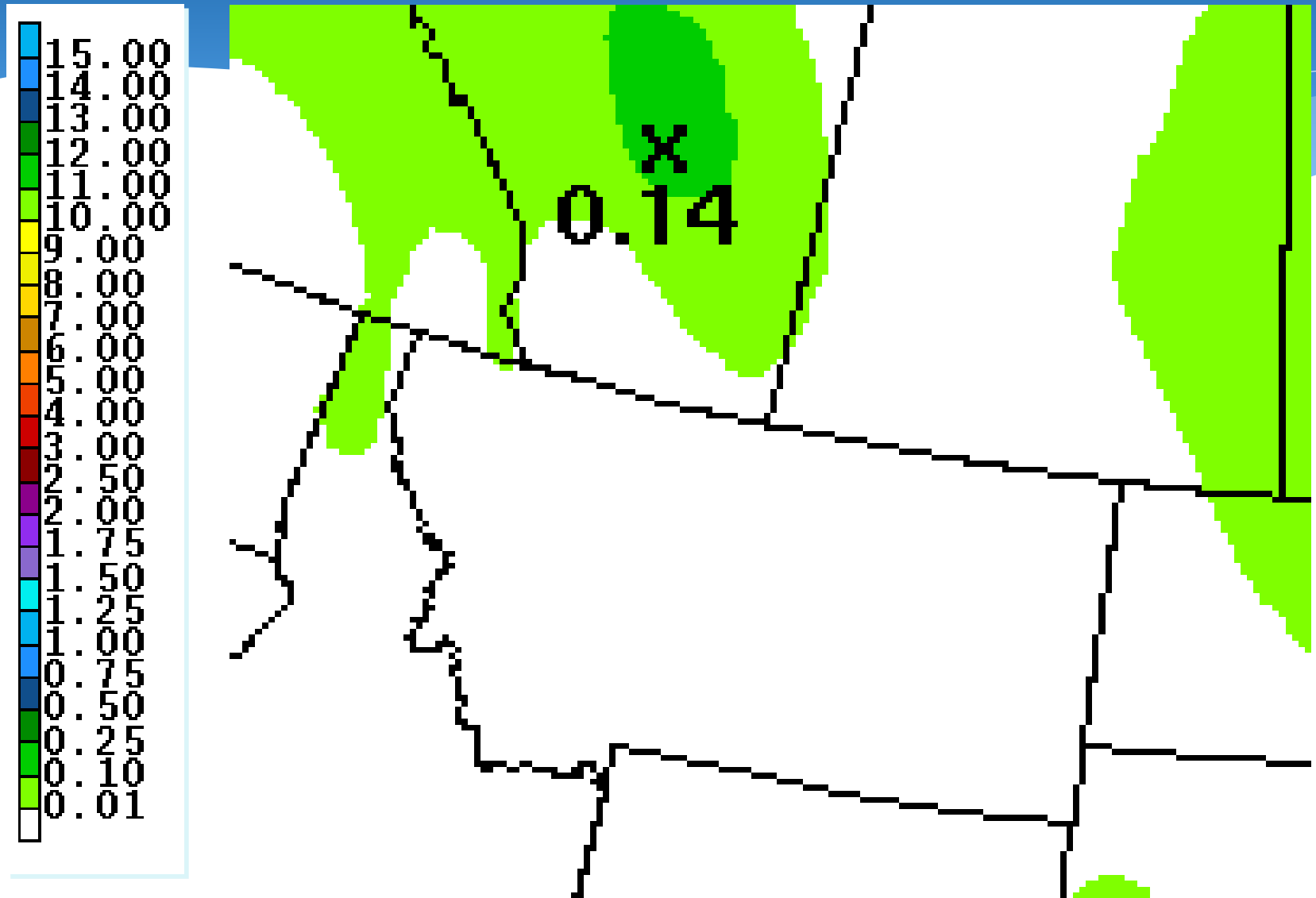




# July 20-22 Precipitation Forecast

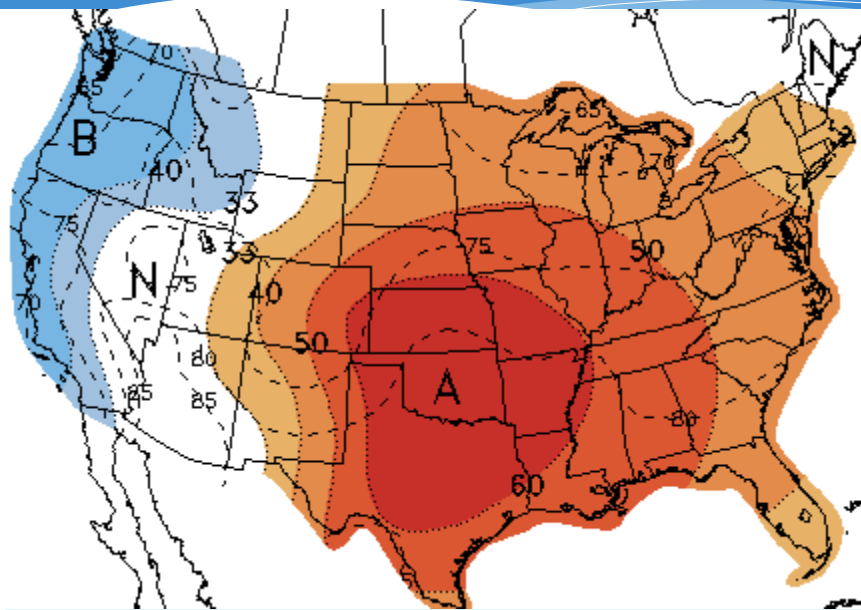


# July 23-25 Precipitation



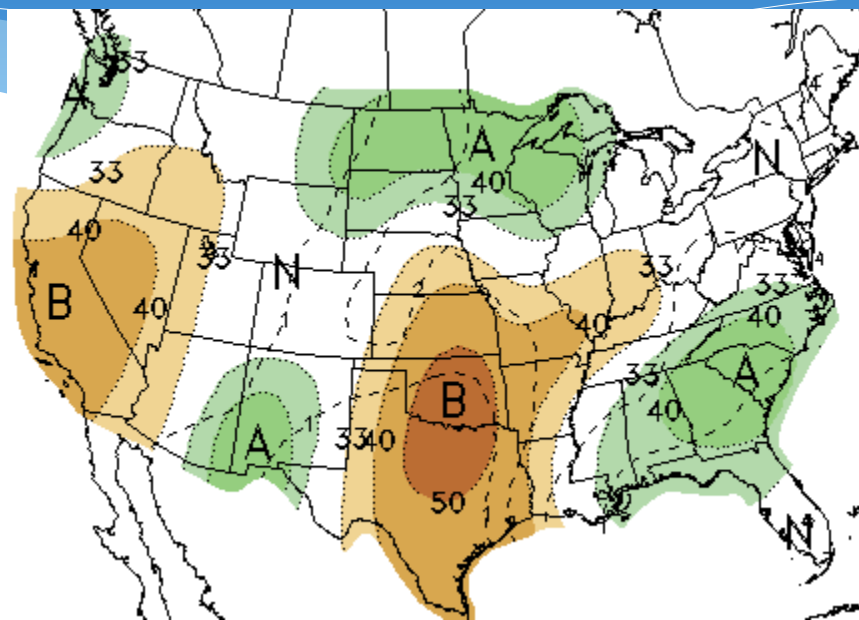
# 6 to 10 Day Outlook July 25 – 29

## Temperature

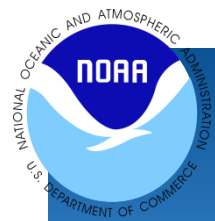


- \* 33% to 40% chance temperatures will be below normal across western Montana; 33% to 40% chance temperatures will be above normal eastern Montana
- \* Averages
  - \* Highs – upper 70s to upper 80
  - \* Lows – lower 40s to lower 60s

## Precipitation

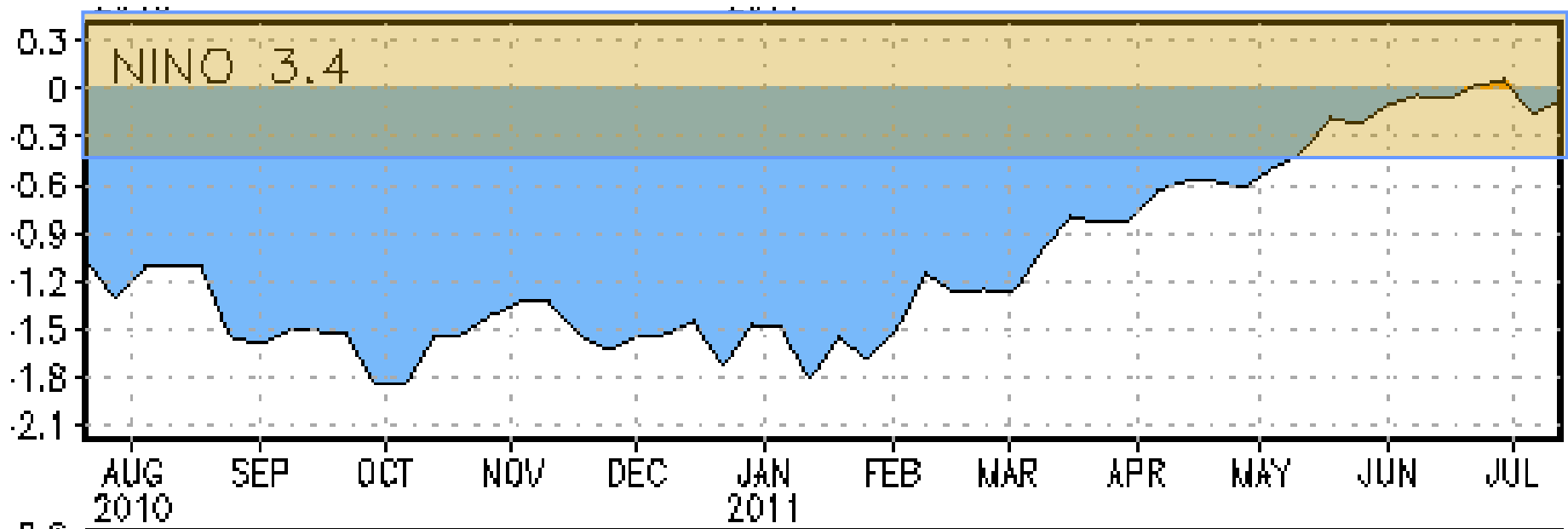


- \* 33% to 50% chance precipitation will be above normal eastern Montana
- \* Averages – 0.15-0.25"

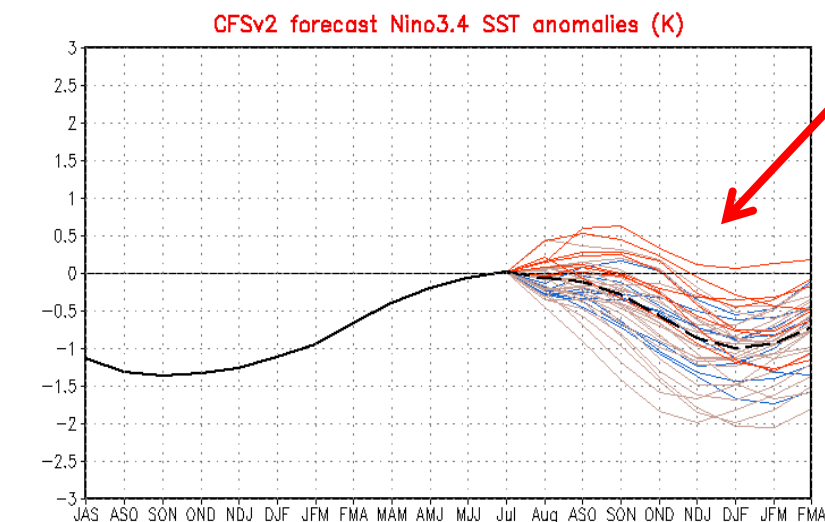
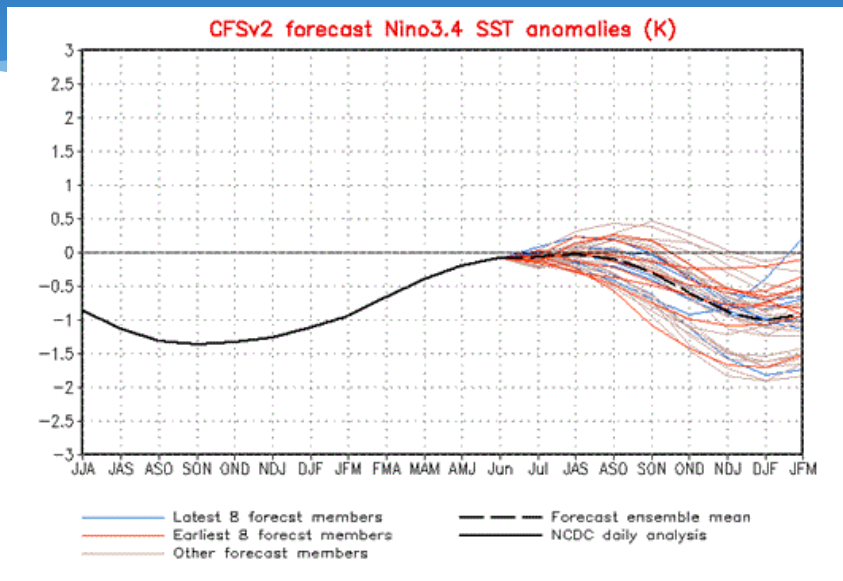


# El Niño / La Niña

- \* Have gone to ENSO-neutral conditions and will persist into autumn 2011



# Forecasts of Region 3.4 Sea Surface Temperature

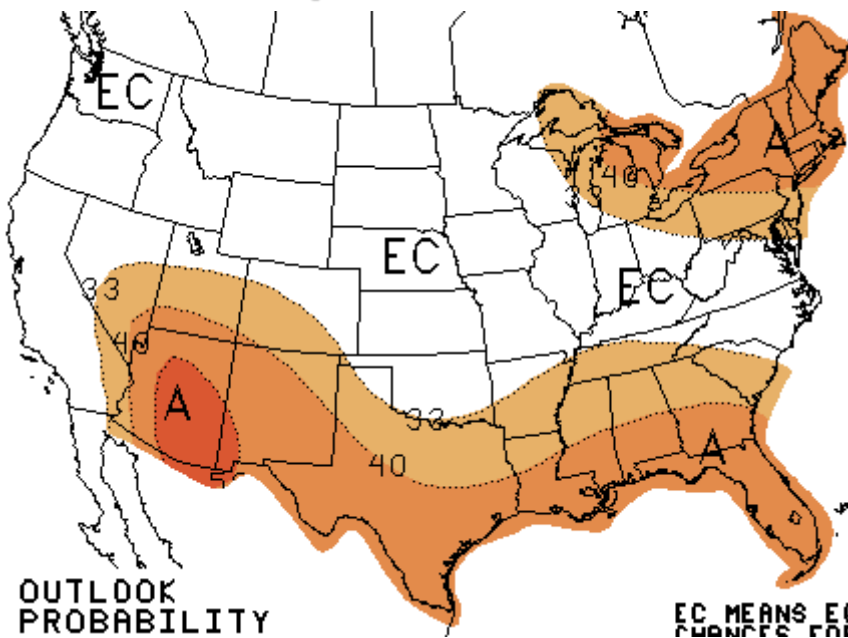


**This is the most recent public outlook, but some recent models runs show less certainty of diving back into La Nina Conditions**

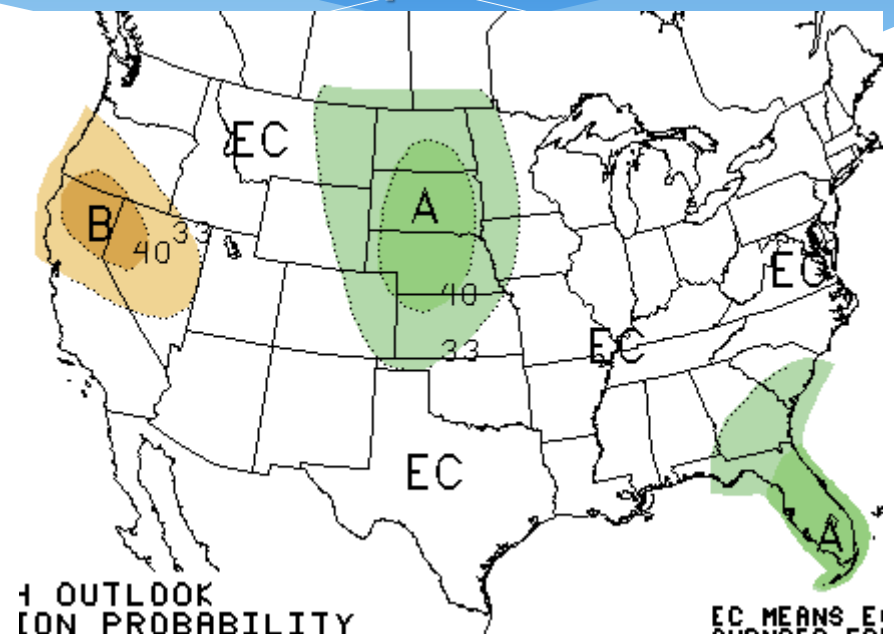
# August – October Outlook

## Issued June 16, 2011

### Temperature

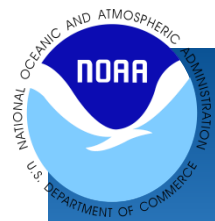


### Precipitation



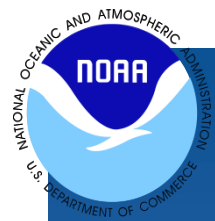
\* Equal chances temperatures will be above...below or near normal

\* Better chances precipitation will be above normal eastern third of Montana



# In Summary...

- \* Drier weather the latter half of June and early July but warmer temperatures kept streamflows up with several sites staying above flood stage into July
- \* August – October outlook calling for equal chances for above, below or near normal temperatures
- \* August – October outlook calling for equal chances for above, below or near normal precipitation west and central...better chances for above normal precipitation east
  - \* New forecast to be issued Thursday July 21
- \* Possibility (with some degree of uncertainty) of a return to La Niña conditions during the late autumn/winter months



# weather.gov

[weather.gov/billings](https://weather.gov/billings)

[weather.gov/glasgow](https://weather.gov/glasgow)

[weather.gov/missoula](https://weather.gov/missoula)

[weather.gov/greatfalls](https://weather.gov/greatfalls)